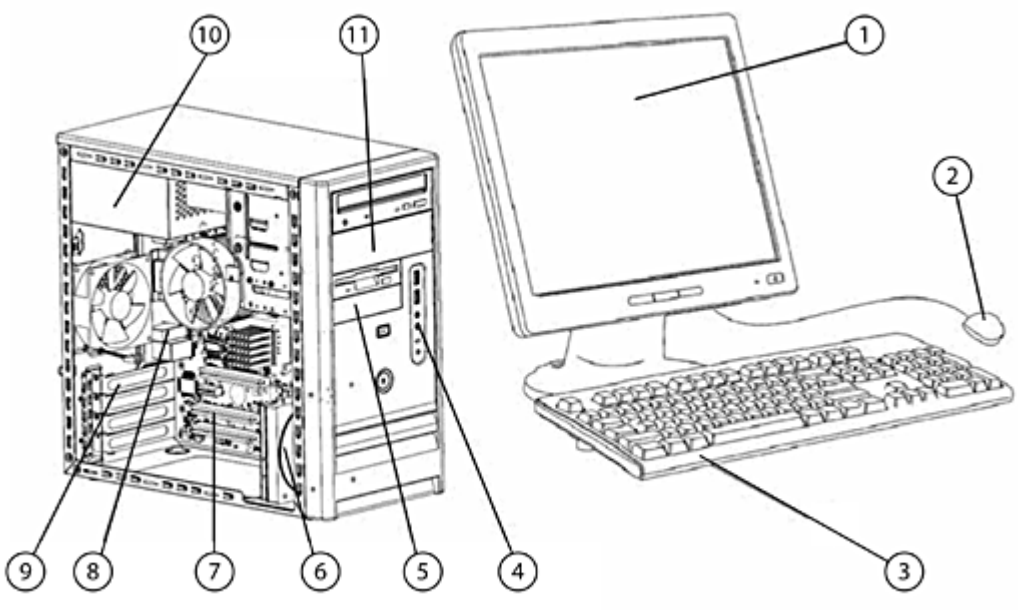
Overview

HP recommends Windows® Vista™ Business

Microtower



1. Monitor (sold separately)
2. 2-Button Scroll Mouse
3. HP Standard Keyboard
4. 2 PCI 2.2 slots, 1 PCI-Ex1 slot, 1 PCI Ex16 slot
5. 2 internal 3.5" drive bays
6. 2 external 3.5" drive bays for optional diskette drive
7. 2 PCI 2.2 slots, 2 PCI-Ex1 slot ,1 PCI Ex16 slot
8. 6 USB 2.0 ports, 1 serial ports, 1 parallel port, 2 PS/2, 1 RJ-45, 1 VGA, 1 audio in, 1 audio out, 1 MIC
9. 300-watt max power supply
10. 2 external 5.25" drive bays for optional optical drives
11. 2 Optional USB ports and 1 Optional Serial port.

Overview

At A Glance

- Intel® Pentium D, Pentium 4, Intel Celeron D and Core 2 Duo processors
- Choice of operating systems:
  - Microsoft Windows XP Home
  - Microsoft Windows XP Professional
  - Free DOS for India
  - Red Flag /Redhat Linux
  - Windows Vista Basic & Business 32-bit
  - Windows Vista Basic & Business 64-bit
- Intel Q965/ICH8 chipset
- Intel Graphics Media Accelerator GMA 3000
- Total 4 PCI slots (2*PCI slot,1 PCIe x1, 1PCIe x 16)
- Integrated SATA II controllers with 6 SATA ports (2 SATA ports can be configured as RAID), 1 PATA PORT.
- Integrated Broadcom 10/100/1000 Network Connection with WOL.
- Integrated 8 channel HD Audio.
- Choice of hard drives and optical drives
- HP Bizcover Diagnostics and Recovery Manager
- Desktop management tool.
- Single or dual channel DDRII SDRAM system memory DDR667/DDR 80
- Protected by HP Services. Terms and conditions vary by country. Certain restrictions and exclusions apply.
- System FCC,UL certified for India and UL, CCC certified for China

Standard Features and Configurable Components

Processor and Speed
One of the following

Intel Celeron D Processors
Intel Celeron D 331 Processor (2.66-GHz, 256-KB L2 cache, 533-MHz FSB)
Intel Celeron D 336 Processor (2.80-GHz, 256-KB L2 cache, 533-MHz FSB)
Intel Celeron D 347 Processor (3.06-GHz, 512-KB L2 cache, 533-MHz FSB)
Intel Celeron D 352 Processor (3.20-GHz, 512-KB L2 cache, 533-MHz FSB)
Intel Celeron D 356 Processor (3.33-GHz, 512-KB L2 cache, 533-MHz FSB)
Intel Celeron D 360 Processor (3.46-GHz, 512-KB L2 cache, 533-MHz FSB)
Intel Celeron D 365 Processor (3.60-GHz, 512-KB L2 cache, 533-MHz FSB)

Intel Pentium 4 Processors with Hyper-Threading
Intel Pentium 4 631 Processor (3.06-GHz, 2-MB L2 cache, 800 -MHz FSB)
Intel Pentium 4 641 Processor (3.20-GHz, 2-MB L2 cache, 800-MHz FSB)
Intel Pentium 4 651 Processor (3.40-GHz, 2-MB L2 cache, 800-MHz FSB)
Intel Pentium 4 661 Processor (3.6-GHz, 2-MB L2 cache, 800-MHz FSB)

Intel Pentium D Processors
Intel Pentium D 915 Processor (2.8-GHz, 2x2-MB L2 cache, 800-MHz FSB)
Intel Pentium D 925 Processor (3.0-GHz, 2x2-MB L2 cache, 800-MHz FSB)
Intel Pentium D 935 Processor (3.20-GHz, 2x2-MB L2 cache, 800-MHz FSB)
Intel Pentium D 945 Processor (3.40-GHz, 2x2-MB L2 cache, 800-MHz FSB)

Intel Core 2 Duo Processor
Intel Core 2 Duo E6300 Processor (1.86-GHz, 2-MB L2 Cache, 1066-MHz)
Intel Core 2 Duo E6400 Processor (2.13-GHz, 2-MB L2 Cache, 1066-MHz)
Intel Core 2 Duo E6600 Processor (2.40-GHz, 4-MB L2 Cache, 1066-MHz)
Intel Core 2 Duo E6700 Processor (2.66-GHz, 4-MB L2 Cache, 1066-MHz)
Intel Core 2 Duo E4300 Processor (1.80-GHz, 2-MB L2 Cache, 800-MHz)

Operating Systems and Application Software

Genuine Windows Vista Business 32/64*
Genuine Windows Vista Home Basic 32/64*
Genuine Windows XP Professional SP2
Genuine Windows XP Home SP2
Red Flag Linux
Free DOS

*Not all Windows Vista features are available for use on all Windows Vista Capable PCs. All Windows Vista Capable PCs will run the core experiences of Windows Vista, such as innovations in organizing and finding information, security, and reliability. Some features available in premium editions of Windows Vista -- like the new Windows Aero™ user interface -- require advanced or additional hardware. Check http://www.windowsvista.com/getready for details
NOTE: Microsoft Windows NT 4.0 and Microsoft Windows 2000 are not available on these systems. Some drivers for Windows 2000 are available for download from http://www.hp.com.

Microsoft Office 2003 Basic (availability varies by region)
Microsoft Office 2003 Small Business (availability varies by region)
Microsoft Office 2003 Professional (availability varies by region)
Microsoft Works 8.5 (availability varies by region)
Microsoft Office 2007

	Symantec Antivirus. HP Insight Diagnostics (on documentation CD) Desktop Management Tool (availability varies by region) Tool for Health management, Asset Management and Remote Management SDM (Tool for pre failure Alert on HDD- Available with Windows XP currently).
Hard Drives	80-GB Serial ATA 3.0-Gb/s Hard Drive (7200 rpm) 160-GB Serial ATA 3.0-Gb/s Hard Drive (7200 rpm) 250-GB Serial ATA 3.0-Gb/s Hard Drive (7200 rpm) NOTE: The Serial ATA interfaces in the HP Compaq dx7380 Micro tower support data transfer rates up to 3.0 Gb/s.
System Memory Single Channel Configurations	256-MB DDR II Synch DRAM PC 5300 (667-MHz) Non-ECC (1 x 256-MB) 256-MB DDR II Synch DRAM PC 5300 (800-MHz) Non-ECC (1 x 256-MB) 512-MB DDR II Synch DRAM PC5300 (667-MHz) Non-ECC (1 x 512-MB) 512-MB DDR II Synch DRAM PC5300 (800-MHz) Non-ECC (1 x 512-MB) 1-GB DDR II Synch DRAM PC5300 (667-MHz) Non-ECC (1 x 1-GB) 1-GB DDR II Synch DRAM PC5300 (800-MHz) Non-ECC (1 x 1-GB)
System Memory Dual Channel Configurations	512-MB DDRII Synch DRAM PC5300 (667-MHz) Non-ECC (2 x 256-MB) 512-MB DDR II Synch DRAM PC4200 (800-MHz) Non-ECC (2 x 256-MB) 1-GB DDR II Synch DRAM PC 5300 (667-MHz) Non-ECC (2 x 512-MB) 1-GB DDR II Synch DRAM PC 5300 (800-MHz) Non-ECC (2 x 512-MB) 2-GB DDR Synch DRAM PC5300 (667-MHz) Non-ECC (2 x 1-GB) 2-GB DDR Synch DRAM PC5300 (800-MHz) Non-ECC (2 x 1-GB) 2-GB DDR Synch DRAM PC5300 (667-MHz) Non-ECC (4 x 512MB) 2-GB DDR Synch DRAM PC5300 (800-MHz) Non-ECC (4 x 512MB) 4-GB DDR Synch DRAM PC5300 (667-MHz) Non-ECC (4 x 1 GB) 4-GB DDR Synch DRAM PC5300 (800-MHz) Non-ECC (4 x 1 GB) NOTE: For best performance, memory speeds and sizes should not be mixed. See memory section for more information.
Storage – One or more of the following (see Storage section below)	Diskette Drive 1.44-MB Diskette Drive Optical Drives (SATA) 52X CD-ROM drive (available in APJ only) 48X/32X/48X CD-RW drive 16X/48X DVD-ROM drive 48X/32X Combo CD-RW/DVD-ROM Drive 16X DVD+/-RW * For Vista OS only DVD/COMBO/DVDRW will be supported. ** PATA ODD not supported on this.

Standard Features and Configurable Components

Keyboard – One of the following	HP PS/2 Standard Keyboard HP USB Standard Keyboard
Mouse – One of the following	PS/2 2-Button Scroll Mouse USB 2-Button Optical Scroll Mouse PS2 – Optical Mouse USB 2-Button Scroll Mouse
Audio	8-channel High definition audio (Realtek ALC 888)
Communication	Integrated Broadcom 10/100/1000 Network Connection (BCM 5787) Agere 56K PCI Modem
Graphics	On board Intel Graphics Media Accelerator GMA 3000

System Details

Base Unit

- Micro ATX Microtower chassis, including power supply and front bezel
- Six (6) drive bays and three expansion slots
- Microsoft operating system CD
- System board with Intel Q965 chipset, integrated Broadcom 10/100/1000 Network Connection, integrated graphics and audio, 2 PCI slots, 1 PCIEx16 ,1 PCI Express x1 slot, 4 DDR II DIMM memory slots
- 2 Serial ATA data cable (one for connecting HDD/one for connecting SATA ODD)
- System fan /cooler
- Product documentation on CD
- HP system restore CD
- Power cord
- Chassis intrusion alert
- Recovery Cable
- 300W PSU

Slots	**PCI**	Two (2) PCI 2.2 slots on PCA One (1) PCI Express x1 slot on PCA One (1) PCI Express x16 slot on PCA
	Memory Expansion	Four (4) DIMM slots (4 GB maximum memory support)
Bays	**Internal**	Two (2) 3.50" internal
	External	Two (2) 5.25" external Two (2) 3.50" external
USB Support	High-speed USB 2.0 controller Total: 10 Numbers, Two (2) front ports; Six (6) rear ports: Two (2) Optional .	
Interfaces (Legacy)	One (1) parallel port One (1) serial port , One optional second serial port One (1) PS/2 keyboard port One (1) PS/2 mouse port One (1) analog VGA video port One (1) line in; one (1) line out; one (1) mic in One (1) RJ-45 network port Front Audio One (1) Speaker One (1) MIC	

System Details

Weight & Dimensions	Chassis Dimensions (H x W x D)	14.37 x 7.08 x 15.15 in (36.5 x 18.0 x 38.50 cm)
	Packaged Dimensions (L x W x H)	23.2 x 19.6 x 10.9 in (58.9 x 49.9 x 27.8 cm)
	System Weight	~ 12.0 kg (depend on configuration)
	Shipping Weight	~ 13.50 kg (depend on configuration)
Intel Pentium 4 Processor	Coprocessor	Integrated
	CPU Socket Type/Number	Socket T LGA775 socket
	CPU Package	LGA775
	Front Side Bus Speed	533/800/1066-MHz
	Cache Memory	2MB L2 Cache
Intel Celeron D Processor	Coprocessor	Integrated
	CPU Socket Type/Number	Socket T LGA775 socket
	CPU Package	LGA775
	Front Side Bus Speed	533-MHz
	Cache Memory	256-KB /512 KB L2 Advanced Transfer Cache
Intel Core 2 Duo Processor	Coprocessor	Integrated
	CPU Socket Type/Number	Socket T LGA775 socket
	CPU Package	LGA775
	Front Side Bus Speed	800/1066-MHz
	Cache Memory	2 MB /4 MB L2 Cache
Intel Pentium D Processor	Coprocessor	Integrated
	CPU Socket Type/Number	Socket T LGA775 socket
	CPU Package	LGA775
	Front Side Bus Speed	533/800-MHz
	Cache Memory	2x 2MB Advanced Transfer -depend on CPU

System Details

Chassis	Front Panel	Power button Power On LED HDD Activity LED Biz Cover Switch
	Cooling Solutions Supported	Power Supply Fan Active heat sink fan (variable speed) System fan (variable speed)
	Slots Supported	Four (4) PCI & PCIe expansion slots
	Front I/O	Two (2) USB 2.0 ports Two (2) Front Audio ports (1 Headphone, 1 MIC)
	Rear I/O	Standard Micro ATX I/O connectors, including four (6) USB 2.0 ports
	Drive Bays	Two (2) 5-1/4" external Two (2) 3-1/2" external Two (2) 3-1/2" internal
	Power Supply	300-watt ATX Power Supply – non-PFC (for India) 300W ATXP – PFC (for China)

Unit Environment and Operating Conditions

General Unit Operating Guidelines

- Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range.
- Leave a 4 in (10.2 cm) clearance on all vented sides of the computer to permit the required airflow.
- Never restrict airflow into the computer by blocking any vents or air intakes.
- Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.
- Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow.
- If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.

Temperature Range	Operating	5°C to 45 ° C
	Non-operating	-30° to 60° C
Relative Humidity	Operating	10% to 90% (non-condensing at ambient)
	Non-operating	5% to 90% (non-condensing at ambient)

NOTE: Operating temperature is de-rated 1.0 deg C per 300 m (1000 ft) to 3000 m (10,000 ft) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.

System Board	Processor	Socket T; LGA775 Support single Intel Pentium 4, Celeron D, Pentium D or Core 2 Duo.
	Chipset	Intel Q965 Intel ICH8
	Super I/O	ITE IT8718
	Front Side Bus Frequency	533/800/1066-MHz
	Memory	DDR2 x4 DDR800/667 max 4GB 4 x DIMM slots Support for single or dual-channel configurations

System Details

Clock Generator	Realtek RMT876-660
Integrated Graphics	Intel Graphics Media Accelerator (GMA) 3000
Audio	Realtek ALC888 High definition audio
LAN	Integrated Broadcom 10/100/1000 (BCM5787) network controller
IDE	Support all PIO modes 1 x IDE ports support up to 2 devices Support Ultra ATA 33/66/100 No PATA Drive is validated for this.
SATA/RAID	Six Serial ATA interfaces support data transfer rates up to 3.0 Gb/s Port 4 &5 can be configured for RAID 0 and RAID 1 configuration.
Expansion Slots	2 x PCI 2.2 slots 1 x PCI Express x1 slot 1 x PCI Express x 16 slot
BIOS	8Mbit flash EEPROM
Manageability	WfM 2.0, SMBus,, WOL , DMI 2.0 , PXE support
Industrial Standard	PCI 2.2 compliant USB 2.0
Rear Side I/O Ports	1 x PS/2 keyboard port 1 x PS/2 mouse port 6 x USB 2.0 ports 1 x RJ-45 10/100/1000 port 1 x serial port (second serial port optional) 1 x parallel port 1 x DB 15 pin analog VGA port 3 x audio ports
On Board I/O Interfaces	1 x ATX power connector 1 x +12V power connector 1 x Floppy connector 1 x Front panel connector, Switch, LED (ON/Flash/OFF) 2 x Fan headers for CPU, chassis, with voltage/fan speed control 1 x header to support 2 USB 2.0 ports at front side 1 x Second Serial Port header Biz Cover Recovery Switch Cable 1 x header to support 2 USB 2.0 ports for USB internal USB interface devices. 1 x PATA to support 2 IDE ports. 1 x Audio port to support front Audio.
Board Size	Micro-ATX
Additional Features	Support S3, S4 and S5 ACPI status Hardware monitor capability CPU fan speed control Wake on LAN

System Details

Network Interface

Hardware Highlights /Features

Integrated Broadcom Gigabyte Ethernet Controller BCM5787

- Integrated 10/100/1000BASE-T Transceiver.
- Automatic MDI crossover function
- PCIe v1.1 compliant.
- 10/100/1000BASE-T full-duplex/half-duplex MAC
- Wake on LAN (WOL) support meeting the ACPI requirements.
- Statistics for SNMP MIB II, Ethernet like MIB and Ethernet MIB (IEEE 802.3z,Clause 30)
- JTAG support
- Hot plug support
- PCI Express #CLKREQ support
- Energy Detect/Cable Sense

Power Supply

- ATX Power Supply – non-PFC (for India) – PFC (for China).
- 220 to 230VAC input voltage range
- 50-60 Hz rated line frequency
- 300 watt maximum power
- Power supply fan
- Over Voltage Protection
- Over Current Protection
- Short Circuit Protection
- FCC, UL, approved for India.
- FCC, UL and CCC approved for China.

Power Conservation 'Energy Saver'

- Screen blanking
- Hard drive 'Idle' mode
- System Idle mode
- Processor/Cache memory power-down (S3)

System Environmental Specs

- Values are subject to change without notification and are for reference only.
- Performance of system, options, and ancillary equipment will vary depending on the system configuration.
- Levels presented do not account for non-HP/Compaq installed hardware.

Ambient Air Temperature	Operating	50° to 104°F (10° to 45°C) at sea level with an altitude de-rating of 1.0°C per every 1000 ft (300 m) above sea level to a maximum of 8000 ft (2500 m), no direct sustained sunlight. Maximum rate of change is 77°F/Hr (25°C/Hr). The upper limit may be limited by the type and number of options installed.
	Storage	-22° to 140°F (-30° to 60°C) – Maximum rate of change: 410°F/Hr (210°C/Hr).
Humidity	Operating	10% to 90% relative humidity (Rh), 86°F (30°C) maximum wet bulb temperature, non-condensing
	Storage	10% to 95% relative humidity (Rh), 101.66°F (38.7°C) maximum wet bulb temperature, non-condensing

System Details

Altitude	Operating	0 to 8,000 feet (0 to 2438.4 meters) - This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1,000 ft/min (304.8 m/min).
	Non-Operating	0 to 30,000 feet (0 to 9,144 meters) - Maximum allowable altitude change rate is 1200 ft/min (365.76 m/min).
Shock	Listed are the levels of shock the product can withstand with NO damage being incurred? The values represent peak input acceleration during a 2~3 ms half-sine shock pulse, 11 ms trapezoidal shock pulse.	
	Non-Operating	45G's (Half-sine Shock) 45G's (Trapezoidal Shock)
Vibration	Listed are the levels of vibration the product can withstand with NO damage being incurred? The values represent a flat random vibration input acceleration profile across the given frequency range.	
	Operating	Random vibration at 5Hz@0.00025G2/Hz, 10Hz@0.01G2/Hz, 100Hz@0.01G2/Hz, 300Hz@0.00001G2/Hz 5Hz to 300Hz, (0.25G's nominal).
	Non-Operating	Random vibration at 0.008G^2/Hz, 10Hz to 500Hz, (2 Grms nominal).
Acoustic Noise	Listed are the declared A-WEIGHTED SOUND POWER LEVELS (LWAd) and declared average desktop seated operator position A-WEIGHTED SOUND PRESSURE LEVELS (LpAm) when the product is operating in a 73.4°F (23°C) ambient environment.	
	IDLE (Fixed disk drive spinning)	Desktop Average LpAm = 35 dBA
	Operating (Random write)	Desktop Average LpAm = 42 dBA

Service and Support	On-site Warranty[1]: One-year (1-1-1) limited warranty delivers one year of on-site, next business day or second business-day[2] service for parts and labor and includes free telephone support[3] 24 x 7. Additional configurable warranty options (sold separately) include: three years parts and one year labor (3/1/1), or 3 years next business day, three years parts and three years labor (3/3/3). [1]Terms and conditions may vary by country. Certain restrictions and exclusions apply. [2]On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country. [3]Technical telephone support applies only to HP-configured Compaq and third-party HP-qualified hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

After-Market Options

Communications	**Modems**	
	Agere PCI Hi-Speed 56K International SoftModem	EK694AA
	RJ-11 Modem adapter Kit (country /network) specific	DC131C
Hard Disk Drives	250-GB SATA 3.0-Gb/s Hard Drive	PY278AA
	160-GB SATA 3.0-Gb/s Hard Drive	PY277AA
	80-GB SATA 3.0-Gb/s Hard Drive	PY276AA
Removable Storage Devices	**Diskette Drive**	
	1.44-MB Internal Diskette Drive for dx7380	EY084AA
	1.44-MB USB Diskette Drive - External	DC141B
	USB Drive Key	
	512-MB HP Drive Key II (USB 2.0)	ED516AA
	1GB HP Drive Key II (USB 2.0)	AG382AA
Input Devices	**Keyboards**	
	HP PS/2 Standard Keyboard	DT527A
	HP USB Standard Keyboard	DT528A
	HP USB Smart Card Keyboard	ED707AA
	Mice	
	HP PS/2 2-Button Scroll Mouse	DD440B
	HP USB 2-Button Scroll Mouse	DD441B
	HP USB 2-Button Optical Scroll Mouse	DC172B
Optical Drives	52X Max CD-ROM Drive (available in Asia Pacific and Japan only)	AG041AA
	48X/32X/48X CD-RW Drive	DL975B
	48X/32X Combo Drive CD-RW / DVD-ROM Drive	DL976B
	16X/48X DVD-ROM Drive	PR596A
	16X DVD+/-RW	PR595A
Miscellaneous Accessories	Adaptec FireConnect 2100 FireWire (1394) PCI Card	PA997A
	USB to Serial Adaptor	EM449AA

After-Market Options

Monitors	HP L1506 Flat Panel Monitor (15" analog only)	PX848AA
	HP L1706 Flat Panel Monitor (17" analog only)	PX849AA
	HP L1906 Flat Panel Monitor (19" analog only)	PX850AA
	HP L1740 Flat Panel Monitor (17" analog only)	PL766AA
	HP L1755 Flat Panel Monitor (17" analog only)	PL777AA
	HP L1940T Flat Panel Monitor (19" analog only)	EM869AA
	HP L1955 Flat Panel Monitor (19" analog only)	PD974AA
	HP L2065 Flat Panel Monitor 20" analog only)	EF227A4
	HP S5502 15" CRT	PQ560AA
	HP S7540 17" CRT	PF997AA
	HP v7650 FLAT FACE CRT	PF996AA

Memory

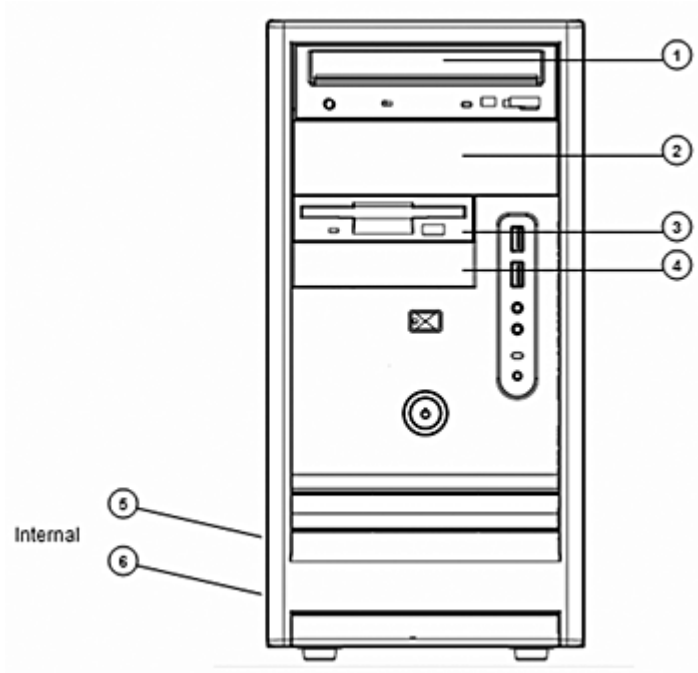
Intel Q965 Express Chipset
DDR2 SYNC DRAM NON-ECC MEMORY
It is not necessary to add memory in pairs. Memory upgrades are accomplished by adding single or multiple DIMMs of the same or various sizes. This chart does not represent all possible combinations. The Intel Q965 Express chipset support non-ECC PC2-5300(667MHz) and PC2-6400 memory.

For best performance add in pairs, add in same channel and do not mix speeds. For dual channel the total amount of memory in each channel should be equal. If speeds are mixed, speed will default to the slowest DIMM.

MAXIMUM MEMORY
Supports up to 4-GB of DDR2 SYNCH DRAM. Not all memory configurations possible are represented below.
NOTE: In 4-GB configuration, all memory may not be available due to system resource requirement.

DIMM Size	Slot			
	Channel A		Channel B	
	1	2	3	4
256MB	256MB			
512MB	512MB			
512MB (dual channel)	256MB		256MB	
1GB	1GB			
1GB (dual channel)	512MB		512MB	
2GB (dual channel)	512MB	512MB	512MB	512MB
2GB (dual channel)	1GB		1GB	
4GB maximum (dual channel)	1GB	1GB	1GB	1GB

Storage



HP Compaq dx7380 Microtower Business PC

	Maximum Quantity Supported	Position Supported	Controller
Drive Support			
Diskette Drives	1	3,4	ICH8
CD-ROM Drives	2	1,2	ICH8
DVD-ROM Drives	2	1,2	ICH8
CD-RW/Combo Drives	2	1,2	ICH8
DVD+/-RW Drives	2	1,2	ICH8
3.5" Serial ATA Hard Drives (SATA port no 0,1,2,3)	2	5,6	ICH8
If SATA Port nos. 4 & 5 used for HDD connection	2	5,6	JMB363

Technical Specifications - Audio

Integrated Realtek ALC888 Audio	Type	Integrated
	High Definition Stereo Codec	Yes
	Sampling	Supports 44.1KHz to 192 KHz Support 16/20/24 bit PCM format, 3D audio
	Audio Jacks	Mic-In
		Line-In
		Line-Out / Headphone Out
	Power Support	Digital: 3.3V
		Analog: 3.0 to ~5.0 V
	Other	Meets performance requirements for audio on PC99/2001 systems High quality differential CD input

Agere 56K PCI Modem	Data Transmission	56,000 Kbps maximum downstream data NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.
	Data Speeds	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300
	Data Standards	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
	Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/300 b/s
	Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
	Error Correction and Data Compression	V.44, 42bis, V.42 and MNP2-5
	Power Management	ACPI; PPMI 1.1 and wake support with PME and Vaux; meets PCI 2.3 requirements and PC 2001 requirements
	Upgradeability	Driver upgradeable for future enhancements
	Video	ITU-T V.80 video ready interface
	Other	TIA/EIA 602 standard AT command set Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface Optional ring wakeup signal
	Operating Temperature	32° to 158° F (0° to 70° C)
	Operating Humidity	20% to 90%, non-condensing
	Power	Requires a 3.3-V auxiliary power rail on PCI bus Uses only one PCI load (i.e., one grant/request pair), one shared IRQ, one electrical load
	Chipset	Agere Systems SV92PL – Integrated PCI interface with 5-V tolerant buffers and CardBus support
	Dimensions (L X H)	Complies with PCI low profile specifications-6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets
	Connection	Single RJ-11 connector
	Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
	Safety	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark
	EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
	Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
	Health	Bare PCB material compliant to 94V-0 or better (marked as such)
	Other	PC 2001 compliant, PCI version 2.3, WHQL approved; ACPI compliant

Technical Specifications - Communications

Broadcom Integrated Gigabit Ethernet Controller	Connector	RJ-45
	Controller	Broadcom BCM5787M Integrated Gigabit Ethernet Controller
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.3, 802.1Q, 802.3ab and 802.3u compliant, 802.3x flow control
	Bus architecture	PCIe v1.1
	WOL Support	Yes
	Data transfer mode	Bus-master DMA
	Power requirement	+3.3 Volt signaling, 5V PCI I/O tolerant
	Boot ROM support	Yes
	Network transfer mode	Full-duplex
		Half-duplex
	Other features	WOL and PXE support
		Auto Negotiation
		Cross over Detection and auto correction
		ACPI support
		Transmit /receipt FIFO – 8K /64K support

Technical Specifications - Graphics

Graphics and Video Features of the Intel 965 Express Chipset Family	Platform	Intel Q965 Express Chipset
	Hardware T&L	No
	Floating Point Operations/Render Target	Fixed Point
	Vertex Shader Model	2.0/3.0 (Software)
	Pixel Shader Model	2.0
	MPEG-2 Decode	Hardware Motion Compensation
	WMV9 HD Decode	SSE/SSE2 Optimized Processor Support (S/W only)
	De-interfacing	Advanced De-interfacing (SD only)
	Color Control (ProcAmp)	N/A
	Content Protection	COPP/PMP w/ HDCP
	Display Support (through SDVO devices)	Dual Independent
	Display Support	RGB (QXGA) DVL HDTV (1080i, 720p), Composite Component, S-Video (via Intel SDVO)
	Max Resolution	QXGA 75 Hz (2048x1536)
	Peak Memory Bandwidth	12.8 GB/s
	Max Dynamic Video Memory (with DVMT 4.0)	256 MB
	DirectX API Support	DirectX 9.0c
	OpenGL API Support	1.4 + Extensions
	DirectX VA Support	v1.0/v2.0
	Microsoft Windows Vista Support	Vista Premium
	Microsoft Windows Driver Model	XPDM and WDDM
	Linux	Red Hat, SuSE

Technical Specifications - Graphics

NVIDIA Quadro NVS 285 128MB PCIe Dual Display	Form Factor	Nvidia Quadro NVS 285 128MB PCIe Dual Display Low profile, both ATX and low profile brackets included
	Graphics Controller	Integrated Quadro 285 2D graphics processor unit (GPU)
	Bus Type	PCI-Express
	Memory	128 MB DDR2
	Connectors	Single high-density DMS-59 Flex Connector
	Dimensions	Low-profile, 2.586 x 6.6 in (6.57 x 16.76 cm)
	Multi-monitor support	Dual analog or digital monitors
	RAMDAC	Dual 350 MHz (integrated)
	Maximum pixel clock	350 MHz
	Overlay planes	One 16-bit Video overlay plane
	High-definition Video Processor (HDVP)	Full screen, full frame video playback of HDTV and DVD content DVD-ready motion compensation for MPEG-2 Independent hardware color controls for video overlay Hardware color-space conversion (YUV 4:2:2 and 4:2:0) IDCT motion compensation 5-tap horizontal by 3-tap vertical filtering 8:1 up/down scaling
	Available graphics drivers	Microsoft Windows 2000 and Microsoft Windows XP (Provides full native Dual View mode, Span or Big Desktop mode, and Clone mode) HP qualified drivers may be preloaded or available from the HP support Web site: http://www.hp.com/country/us/en/support.html?pageDisplay=drivers
	Option kit Contents	NVIDIA Quadro NVS 285 128MB PCIe Graphics Card with full height bracket attached, DMS 59 to dual DVI Y cable, DMS 59 to dual VGA Y cable, low profile bracket, Workstation Software Driver CD, Desktop Software Driver CD, documentation.

VGA Specifications	Model	NVIDIA 7100	NVIDIA 7300
	GPU	Geforce 7100 GS (NV44)	Geforce 7300 LE (G72)
	Core Clock	350 MHz	450 MHz
	Mem Clock	700 MHz	700 MHz
	Mem Size	128 MB on card	128 MB on card
	Mem Bus	TurboCache	64-bit
	Card Bus	PCIEx16	PCIEx16
	Board Form	ATX	ATX
	Board Size	177.77 x 68.9 mm	177.77 x 68.9 mm
	Pixel Pipeline	4	4
	Mem Type	16x16-2.8 DDRII	16x16-2.8 DDRII
	Mem Package	uBGA	uBGA
	Memory (pcs)	4	4
	HDCP Support	No	Yes
	Direct X	9.0c	9.0c

D-SUB	Yes	Yes
TV-OUT	S/AV	No
DVI Port	DVI-I	DVI-I

HP PS/2 or USB Standard Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country)
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
		Weight	2 lb (0.9 kg) minimum
	Electrical	Operating voltage	+ 5VDC ± 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		ESD	CE level 4, 15-kV air discharge
		EMI – RFI	Conforms to FCC rules for a Class B computing device
		MicrosoftPC 99 – 2001	Functionally compliant
	Mechanical	Languages	38 available
		Keycaps	Low-profile design
		Switch actuation	55-g nominal peak force with tactile feedback
		Switch life	20 million keystrokes (using Hasco modified tester)
		Switch type	Contamination-resistant switch membrane
		Key-leveling mechanisms	For all double-wide and greater-length keys
		Cable length	6 ft (1.8 m)
		Microsoft PC 99 – 2001	Mechanically compliant
		Acoustics	43-dBA maximum sound pressure level
	Environmental	Operating temperature	50° to 122° F (10° to 50° C)
		Non-operating temperature	-22° to 140° F (-30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
		Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
	Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
	Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	

Technical Specifications - Input Devices

HP 2-Button Scroll Mouse	Scroll Wheel	8 mm	
	Maximum Rotation Speed	30 mm/s	
	Switch Type	Light force micro-switch	
	Switch Life	1 million operations	
	Mechanical Life	Minimum 200,000 revolutions	
	Environmental	Operating Temperature	50° to 122° F (10° to 50° C)
		Non-operating Temperature	-22° to 140° F (-30° to 60° C)
		Operating Humidity	10% to 90% (non condensing at ambient)
		Non-operating Humidity	20% to 80% (non condensing at ambient)
		Operating Shock	40 g, 6 surfaces
		Non-operating Shock	80 g, 6 surfaces
		Operating Vibration	2 g peak acceleration
		Non-operating Vibration	4 g peak acceleration
	Electrical	Operating Voltage	+ 5VDC ± 10%
		Power Consumption	15mA
		System Consumption	PS/2 mini-din connector
		ESD	CE level 4, 15 kV air discharge
		EMI-RFI	Conforms to FCC rules for a Class B computing device
		PC98	Functionally compliant
	Mechanical	Resolution	400 ± 20% DPI
		Tracking Speed	10 in/s maximum
		Acceleration	100 in/s
		Switch Actuation	85 g nominal peak force
		Switch Life	1,000,000 operations (using Hasco modified tester)
		Cable Length	2 m
		PC98-99	Mechanically compliant
	Regulatory Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BCIQ, C-Tick	

Serial ATA Hard Drives (7200 rpm)	**80 GB**	**Capacity**	80,026,361,856 bytes	
		Height	1 in (2.6 cm)	
		Width	Media diameter: 3.5 in (8.9 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA	
		Synchronous Transfer Rate (Maximum)	1.5 Gb/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	1.0 ms
			Average	8.5 ms
			Full-Stroke	18 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	156,301,488	
		Operating Temperature	32° to 140° F (0° to 60° C)	
	160 GB	**Capacity**	160,041,885,696 bytes	
		Height	1 in (2.6 cm)	
		Width	Media diameter: 3.5 in (8.9 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA	
		Synchronous Transfer Rate (Maximum)	1.5 Gb/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	1.0 ms
			Average	8.5 ms
			Full-Stroke	18 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	312,581,808	
		Operating Temperature	32° to 140° F (0° to 60° C)	
	250 GB	**Capacity**	250,059,350,016 bytes	
		Height	1 in (2.6 cm)	
		Width	Media diameter: 3.5 in (8.9 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA	
		Synchronous Transfer Rate (Maximum)	1.5 Gb/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.8 ms
			Average	<9.0 ms
			Full-Stroke	=17 ms

Rotational Speed	7,200 rpm
Logical Blocks	488,397,168
Operating Temperature	41° to 131° F (5° to 55° C)

Technical Specifications - Optical Storage

52X CD-ROM Drive	Interface	ATAPI	
	Data Transfer Rate	CDR read – 16X ~ 52X (2400 ~ 7800 KB/s) CDRW read – 12X ~ 24X (1800 ~ 3600 KB/s) Digital audio –12X ~ 24X (1800 ~ 3600 KB/s)	
	Access Time (ms)	Random: <125 ms	Full-stroke seek: <210 ms
	Data Buffer	2 MB	
	Interface Type	E-IDE / ATPI	
	Disk Capacity (CD)	180 MB, 540 MB, 650 MB, and 700 MB	
	Start up Time (Single)	<7 seconds	
	Start up Time (Multi Session)	< 30 seconds	
	Stop up Time	< 4 seconds	
	MTBF	150000 POH @ 25% Duty cycle	
	Disk Diameter	12 cm, 8 cm	
	Disk Thickness	1.2 mm	
	CD Media supported	CDROM, CD DA, CDR, CDRW	
	Block Size	CD -DA (2352 and 2368) Mode 1 (2048 and 2352) , Mode 2 form1 (2048,2328,2336,2340,2352) ,Mode 2 form 2 (2328,2336,2340,2352)	
	Operating Conditions	Temperature	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 90%
	Dimensions (H x W x D, maximum)	1.6 x 5.7 x 7.3 in (4.1 x 14.6 x 18.5 cm)	
48X/32X/48X CD-RW Drive	Orientation	Either horizontal or vertical	
	Disc loading mechanism	Half-height, tray load	
	Interface type	ATAPI IDE	
	Dimensions-external (W x H x D)	7.99 x 5.88 x 1.71 in (20.3 x 14.93 x 4.34 cm)	
	Weight	2.6 lb (1.2 kg)	
	Disc diameter	12 cm, 8 cm	
	Disc thickness	1.2 mm	
	Track pitch	1.6 μm	
	Disc center hole diameter	15 mm	
	Reference scanning velocity	1.2 m/s	
	Recording/playing time	80 minutes with CD-R media	
	Read only disc parameters	Formats and modes supported	CD-ROM-Mode 1; CD-ROM XA-Mode 2 (forms 1 and 2); CD digital audio; CD Extra; CD-I-Mode 2 (forms 1 and 2) and CD-I-Ready; Photo CD (single and multi-session); video CD
		Capacity	185 MB (Mode 2, 8cm); 540 MB (Mode 1, 12 cm); 650 MB (Mode 2, 12 cm); 700 MB (Mode 2, 12 cm)

	Block size	Mode 1-2,048 and 2,352 bytes; mode 2, form 1-2,048; 2,328; 2,336; 2,340 and 2,352 bytes; mode 2, form 2-2,328; 2,336; 2,340 and 2,352 bytes; CD-DA-2,352 and 2,368 bytes	
Writeable disc parameters	Disc type	CD-R and CD-RW	
	Write methods	Disc at Once, Track at Once, Session at Once, Variable Packet, Fixed Packet	
	Format and modes supported	CD-ROM (mode 1); CD-ROM XA (mode 2, forms 1 and 2); CD digital audio, CD-I (mode 2, forms 1 and 2); video CD	
	Capacity	185 MB (Mode 2, 8cm); 540 MB (Mode 1, 12 cm); 650 MB (Mode 2, 12 cm); 700 MB (Mode 2, 12 cm)	
	Block size	Mode 1-2,048 bytes; mode 2, form 1-2,048 and 2,352 bytes; mode 2, form 2-2,352 bytes; CD-DA ---2,352 bytes	
Access times (typical)	Random	< 120 ms	
	Full stroke	< 200 ms	
Data transfer rates	CD-RW write	4800 KB/s (up to 32X)	
	CD-ROM, CD-R read	7200 KB/s (up to 48X)	
	CD-RW read	7200 KB/s (up to 32X)	
	CD-R write	7200 KB/s (up to 48X)	
Data transfer modes	ATA PIO mode 4 (16.7MB/s); ATA multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA mode 0 (16.7 MB/s); ATA UltraDMA mode 1 (24 MB/s); ATA UltraDMA mode 2 (33 MB/s) - default.		
Cache buffer	2 MB (minimum)		
Start-up time (single)	< 7 seconds typical		
Start-up time (multi-session)	< 30 seconds typical		
Stop time	< 4 seconds		
Power	Source	Four-pin, DC power receptacle	
	DC power requirement	5 VDC 5%-100 mV ripple p-p	
		12 VDC 5%-200 mV ripple p-p	
	DC current	5 VCD	< 1A (typical)
			< 1600 mA (maximum)
		12 VCD	< 600 mA (typical)
			< 1.4A (maximum)
		Total Drive Power (Standby mode)	< 2.5 watt
Audio output level	0.7 Vrms		
Configuration jumper block	Master, slave and cable select modes		
Data interface connector	50-pin IDE interface		

	Environmental (all conditions, non-condensing)	Temperature (operating)	41° to 122° F (5° to 50° C)
		Relative Humidity (operating)	10% to 90%
		Maximum Wet Bulb Temperature (operating)	84° F (29° C)
	Certifications, requirements	ACA AS/NZS 3548, ANSI C63.4-1992, CB Test Certificate for IEC 950, CE Mark, CFR 47 part 15, CNS 13438, CSA C22.2 No. 60950, DHHS/FDA - 1040, EN60825, EN55022:1998, EN55024, EN60 950:2000, ICES-003 class B, IEC 61000 4-2 - 4-11, Nordic EN60 950, TUV or VDE EN60 950, UL 60950, C.I.S.P.R. Publication 22 Class B, BSMI, Microsoft® P2001, Microsoft Logo for Windows® 98, 2000 and XP	
16X/48X DVD-ROM Drive	Height	5.25-in, half-height	
	Interface Type	ATAPI	
	Dimensions – External, Excluding Bezel (W x H)	5.88 x 1.71 in (149.5 x 43.5 mm)	
	Disc Diameter	12 cm, 8 cm	
	Disc Thickness	1.2 mm	
	Track Pitch	1.6 μm (CD), 0.74 μm (DVD)	
	Disc Center Hole Diameter	15 mm	
	Disc Formats	DVD-ROM (single and dual layer); DVD-video; DVD-R version 1.0 and 2.0; DVD-RW version 1.0 and 1.1; DVD-R multi-border; DVD+RW; DVD+R, DVD+R DL ; CD-ROM Mode 1 and 2; CD-DA; CD-ROM XA Mode 2, Form 1 and 2; CD-extra; CD-text; CD-I Mode 2, Form 1 and 2; CD-I ready; video CD, CD-bridge; PhotoCD (single and multi-session); CD-R; CD-RW	
	Disc Capacity	DVD-ROM	4.7 GB (DVD-5), 8.54 GB (DVD-9), 9.4 GB (DVD-10), 3.95 GB (DVD-R version 1.0), 4.7 GB (DVD-R version 2.0), 4.7 GB (DVD-RW version 1.0 and 1.1), 4.7 GB (DVD+RW), 4.7G (DVD+R), 8.5 GB (DVD+R DL)
		CD-ROM	540 MB (Mode 1, 12 cm), 640 MB (Mode 2, 12 cm), 700 MB (80 minimum CD-R and CD-RW), 180 MB (8 cm)
	Block Size (bytes)	DVD-ROM - 2048; CD-ROM Mode 0 - 2352; CD-ROM Mode 1 - 2352, 2340, 2336, 2048; CD-ROM Mode 2 - 2352, 2340, 2336, 2048	
	Access Times (typical reads, including settling)	DVD-ROM Single Layer	120 ms (typical)
		CD-ROM Mode 1	90 ms (typical)
		Full Stroke DVD	240 ms (seek) (typical)
		Full Stroke CD	160 ms (seek) (typical)
	Maximum Data Transfer Rates	CD-ROM Read	7200 KB/s (up to 48X)
		DVD-ROM Read	21,600 KB/s (16X) Max
	Data Transfer Modes	PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 3 (44.4 MB/s)	
	Power	Source	Four-pin, DC power receptacle

		DC Power Requirement	5 VDC ± 5% – 100 mV ripple p-p 12 VDC ± 5% – 200 mV ripple p-p
		DC Current	5 VDC – <800 mA typical, < 1000 mA maximum 12 VDC – < 870 mA typical
	Audio Output Level	0.7 Vrms (typical)	
	Configuration Jumper Block	Master, slave, and cable select modes	
	Data Interface Connector	40-pin, shrouded and keyed, flat ribbon	
	Environmental (all conditions non-condensing)	Temperature (operating)	41° to 122° F (5° to 50° C)
		Relative Humidity (operating)	10% to 85%
		Maximum Wet Bulb Temperature (operating)	86° F (30° C)
	Certifications, Approvals	MMC II support, multi-read certification, Microsoft WHQL certification, ACA AS/NZS 3548 class B, CNS 13438, C.I.S.P.R. Pub 22, TUV or VDE EN60950, EN 55022, EN55024, SEMKO, NEMKO, DEMKO, FIMKO, EN 60825-1, UL 60950, and CSA C22.2 60950-2000.	
48X Combo CD-RW/DVD-ROM	Height	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface Type	ATAPI/EIDE	
	Dimensions (W x H x D)	5.77 x 1.71 x 7.36 in (14.66 x 4.34 x 18.69 cm) (external, excluding bezel)	
	Disc diameter	12 cm, 8 cm	
	Disc thickness	0.05 in (1.2 mm)	
	Track pitch	1.6 μm (CD), 0.74 μm (DVD)	
	Disc center hole diameter	0.6 in (15 mm)	
	Reference scanning velocity	1.2 m/s (CD); 3.49 m/s (DVD SL); 3.84 m/s (DVD DL)	
	Read only disc parameters	Formats and modes supported	CD-ROM-Mode 1; CD-ROM XA-Mode 2; CD-Bridge; CD digital audio; CD Extra; Photo CD (single and multi-session); video CD; DVD (single- and double-layer); DVD-R; DVD-RW; DVD-RW Multi-Border; DVD+R; DVD+R Multi-Session , and DVD+RW
		Capacity	180 MB (8 cm); 540 MB (12 cm); 650 MB (12 cm); 700 MB (12 cm); 4.7 GB (DVD-5); 8.54 GB (DVD-9); 9.4 GB (DVD-10)
		Block size	Mode 1-2,048 and 2,352 bytes; mode 2, form 1-2,048; 2,328; 2,336; 2,340 and 2,352 bytes; mode 2, form 2-2,328; 2,336; 2,340 and 2,352 bytes; CD-DA-2,352 bytes; DVD-2,048 bytes
	Writeable Disc	Disc type	CD-R and CD-RW

Technical Specifications - Optical Storage

Parameters	Write methods	Disc at Once, Track at Once, Session at Once, Variable Packet, Fixed Packet
	Format and modes supported	CD-ROM; CD-ROM XA; CD digital audio, video CD; CD-Bridge
	Capacity	180 MB (8 cm); 540 MB (12 cm); 650 MB (12 cm); 700 MB (12 cm)
	Block size	CD-DA-2,352 bytes; mode 0- 2,336 and 2,352 bytes; mode 1-2,048 and 2,352 bytes; mode 2-2,336 and 2,352; mode 2, form 1-2,048 and 2,352 bytes; mode 2, form 2-2,324 and 2,352 bytes
Access Times (typical reads, including settling)	Random DVD	< 140 ms (typical)
	Random CD	< 125 ms, (typical)
	Full Stroke DVD	< 250 ms (seek)
	Full Stroke CD	< 210 ms (seek)
Data Transfer Rates	CD-R write	7200 KB/s (up to 48X)
	CD-RW write	4800 KB/s (up to 32X)
	CD-ROM, CD-R, CD-RW read	7200 KB/s (up to 48X)
	DVD ROM read	21,632 KB/s (16X) Max
Data Transfer Modes	ATA PIO mode 4); ATA Multi-word DMA mode 2; ATA UltraDMA mode 0; ATA UltraDMA mode 1, mode 2; ATA UltraDMA Mode 3 (default)	
	Cache buffer	2 MB (minimum)
	Startup time (single)	< 7 seconds (typical)
	Startup time (multi-session)	< 30 seconds (typical)
	Stop time	< 4 seconds
Power	Source	Four-pin, DC power receptacle
	DC power requirement	5 VDC ± 5%-100 mV ripple p-p
		12 VDC ± 5%-200 mV ripple p-p
	DC current	5 VDC (< 1000 mA typical, < 1600 mA maximum)
		12 VDC (< 600 mA typical, < 1400 mA maximum)
	Total drive power (standby mode)	< 2.5 Watt
Audio Output Level	0.7 Vrms (typical)	
Configuration Jumper Block	Cable select (default), master and slave modes	
Data Interface Connector	40-pin, shrouded and keyed, flat ribbon	
Operating Conditions (all conditions non-condensing)	Temperature (operating)	41° to 122° F (5° to 50° C)
	Relative humidity (operating)	10% to 90%
	Maximum wet bulb temperature (operating)	86° F (30° C)

	Certifications, Requirements	MPC-3 compliant, multi-read requirements, ACA AS/NZS 3548, ANSI C63.4-1992, ATAPI Spec SFF-8020, ATA Spec X3T9.2, CB Bulletin No. 92A, CSA C22.2 No. 950-1995, C.I.S.P.R. Pub 22, EMKO-TSE 207/94, TUV or VDE EN60 950, EN60825-1, Microsoft PC2001 certification, Microsoft Logo for Windows XP, 2000	
16X DVD+/-RW LightScribe Drive (Double Layer/Dual Format)	5.25-inch, half-height, tray-load		
	Orientation	Either horizontal or vertical	
	Interface type	ATAPI/EIDE	
	Disc recording capacity	8.5 GB DL or 4.7 GB standard	
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (max)	2.6 lb (1.2 kg)	
	Write speed	DVD+R	Up to 16X
		DVD+RW	Up to 4X
		DVD+R DL	Up to 2.4X
		DVD-R	Up to 8X
		DVD-RW	Up to 4X
		CD-R	Up to 40X
		CD-RW	Up to 24X
	Read speed	DVD+R/-R/+RW/ -RW/+R DL	Up to 8X
		DVD-ROM	Up to 16X
		CD-ROM, CD-R	Up to 40X
		CD-RW	Up to 32X
	Access time (typical reads, including settling)	**Random**	DVD: < 130 ms (typical), CD: < 120 ms (typical)
		Full Stroke	DVD: < 240 ms (seek), CD: < 200 ms (seek)
		Startup Time	Single-session: < 15 seconds (typical), Multi-session: < 30 seconds (typical)
		Stop Time	< 4 seconds
		Cache Buffer	2 MB (minimum)
		Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)
	Power	**Source**	Four-pin, DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p
			12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC (< 1000 mA typical, 1600 mA maximum)
			12 VDC (< 600 mA typical, 1400 mA maximum)
		Total Drive Power (standby mode)	< 2.5 Watt

Technical Specifications - Optical Storage

Audio output	Line-Out	0.7 VRMS
	Signal-to-Noise Ratio	74 dB
	Channel Separation	65 dB
Environmental conditions (operating - non-condensing)	Temperature	41° to 122° F (5° to 50° C)
	Relative humidity	10% to 90%
	Maximum wet bulb temperature	86° F (30° C)
Regulatory approvals	MPC-3 compliant, multi-read requirements, ATA Spec X3T9.2, ATAPI Spec T13.1153D, ANSI C63.4-1992, UL 1950, ACA AS/NZS 3548, CB Bulletin No. 96A, CSA C22.2 No. 950-1995, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, EMKO-TSE 07/94, TUV EN60950, EN60825-1, MIC, BSMI-CNS 13438, CE, Microsoft PC2001 certification, Microsoft Logo for Windows XP and 2000.	

Technical Specifications - Removable Storage

HP 1.44-MB Diskette Drive	**Size**	3.5 in (8.89 cm)	
	LED Indicators (front panel)	Green	
	Read/Write Capacity per Diskette (high/low)	1.44 MB/720 KB	
	Drive Height	One-third	
	Drive Rotation	300 rpm	
	Transfer Rate (high/low)	500/250 KB/s	
	Bytes/Sector	512	
	Sectors/Track (high/low)	18/9	
	Tracks/Side (high/low)	80/80	
	Access Times	Track-to-Track (high/low)	3/6 ms
		Average (high/low)	94/173 ms
		Settling Time	15 ms
		Latency Average	100 ms
	Cylinders (high/low)	80/80	
	Read/Write Heads	Two	

Eco-Label Certifications & declarations

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- US Energy Star*

* Compliant with Energy Star 3.0; not compliant with Energy Star 4.0 when those requirements take effect

Longevity and Upgrading

This product is designed to be upgraded, possibly extending its useful life by several years. Spare parts are available throughout the warranty period and for up to 15 months after the end of production. Upgradeability features contained in the product include:

- 8 USB ports
- 2 external 5.25" drive bays
- 2 external 3.5" drive bays
- 2 internal 3.5" drive bays
- 2 empty standard PCI slots
- 1 empty standard PCI-EX1 slot
- 4 memory slots
- 1 Serial port
- 1 Parallel port

Material Usage

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

Packaging

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.

- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.
Hewlett-Packard Corporate Environmental Information	For more information about HP's commitment to the environment: Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html ISO 14001 certificates: http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html

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